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## Pre-Collectivization Peasantry Social Dynamics Retroprognosis: Application of Alternative Models

*Leonid Borodkin, Mikhail Svishchev\**

**Abstract:** The events that occurred in the USSR at the end of the 1920s - beginning of the 1930s were given the name »great break«. It was the end of NEP - New Economic Policy. This work applies simulation to retroprognosis of the pre-collectivization peasantry social structure dynamics to »prolong« the NEP rural population social mobility tendencies up to the late 30ies, which offers an opportunity to disclose distinctly the nature of social processes in the countryside before the collectivization, to detect the directions and extent of the social differentiation. Simulation based on Markovs chains allows to assess a theory that market economy inevitably entails rural population differentiation and antagonistic social groups formation from the formerly homogeneous mass of petty commodity producers. The model's parameters were estimated by using the data on the rural social processes, recorded by dynamic censuses of the mid-20ies. The results of simulation indicate that if the NEP economic conditions had been sustained, the peasantry wouldn't have splitted into opposed group, on the contrary, the position of medium strata would have grown stronger against the background of the overall economic growth.

Whether the »Great Break« was historically inevitable or else the Soviet economy would have developed towards further progress of commodity-money relations and expansion of the sphere in which market laws applied turned out to be a most topical question in the historical discussion of the late 80ies. Some maintain that the New Economic Policy (NEP), which gave full play to private initiative and broke loose peasants from the administrative restraints, appeared to be the most successful post-Revolution period in the country's development. The NEP principles far from

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having disclosed their potentialities could have further provided a rapid growth of the economy. Their opponents claim that by the end of the 1920s the country came across difficulties insurmountable in terms of the NEP. The social differentiation was a most serious problem. The commodity production and market was splitting the formerly homogeneous mass of commodity producers into the poor and the well-to-do. The antagonism between the two groups was a source of incessant conflicts shattering the social peace. Growing contrast between the haves and havenots was fraught with new outbursts of social violence. Therefore the Great Break, eliminating the very source of social antagonism - the private property - and paving the way for a largescale production, was inevitable in terms of the historical development. No doubt, so the argument continues, the methods of its implementation were criminal, but sooner or later such steps had to be taken.

The whole discussion is led as if in the subjunctive mood. The point is that the NEP was realised over a historically short span of time and its inherent tendencies failed to evolve distinctly enough. Specifying the latter are the words of the prominent American historian, S.Fitzpatrick, »One cannot answer with certainty the question, whether time would prove its validity. There was no time« (1). Thus, the subject of the discussion is not so much what was in reality, but what would have been, if the commodity - money relations and market had survived for a long time.

In order to answer the questions that have emerged in the discussion, a prognosis (in fact, a retroprognosis) as to how the social and economic processes would have developed if the NEP had been sustained should be worked out. Attempts of that kind based primarily on a speculative and intuitive approach to the social process analysis have already been made, with the resultant »scenarios« distinctly affected by the values espoused by the researchers.

Very often qualitatively contrasted retroprognoses stemmed from the same data. That's why it is necessary to use verifiable and convincing research methods and adequate sources to make the retroprognosis procedure properly scientific.

One of the approaches analysing alternatives to social processes is based on the simulative modelling technique. Simulative models are widely employed in studies of today's socio-economic processes, admitting of (by substituting the subject of knowledge and being its analogue) assumed reproduction of functioning and development variants. This simulation results in more efficient solutions of prediction, management, planning, etc. tasks.

As regards the simulation of historical processes and phenomena a number of specific methodological problems, arise which an associated with the fact that in history we deal with the only »route« of a *historical process* that has been followed in reality.

In his comprehensive review of these problems I. Kovalchenko singled out 2 types of simulative models in historical studies: contrafactual models and alternative ones (2). The contrafactual models don't portray the real and objectively admissible historical development, instead they depict it the way the researcher would like to see it. Simulative models, however, can be an efficient instrument to study alternative historical developments. Simulation of one or another variant of possible outcomes allows to arrive at an indepth understanding of the actual historical development and the essential meaning and significance of the struggle for one or another outcome variant between various social groups (3).

This work applies simulation to retroprognosis of the pre-collectivization peasantry social structure dynamics to »prolong« the NEP rural population social mobility tendencies up to the late 30ies, which offers an opportunity to disclose distinctly the nature of social processes in the village before the collectivization, to detect the directions and extent of the social differentiation. Simulation allows to assess a theory that market economy inevitably entails rural population differentiation and antagonistic social groups formation from the formerly homogeneous mass of petty commodity producers. And if in reality »there was no time« to fully develop a »photo« of the social processes of the 1920s, simulation provides this »time«. A correctly made model can drive the »photo development procedure to the stage, when the contours of the phenomenon under consideration become apparent and clear.

This article continues the study of the NEP economy private sector social processes, we've already analysed (using mathematical simulation) the social mobility of urban entrepreneurs (4).

## Sources

Data of the dynamic censuses of peasant households can be used for petty commodity producers mobility studies (5). The county statistician, N.Chernenkov, who worked in Saratov province at the turn of the XXth century, took the initiative in conducting the dynamic censuses. He came to a conclusion that even with the materials of several successive censuses incorporating the data on quantities of households of different economic prosperity it is impossible to evaluate the rural processes. For a change of the share of one or another group could be brought about by various factors. So N.Chernenkov tried to record statistically what happened to a peasant household over a certain span of time. He proposed that two successive surveys of the same villages be conducted. The surveys should register a household transition into another group by sown areas and working livestock capita over the time span between the successive censuses. All the

data on the »former« and »current« household status were put on a separate »historical« card. The obtained data classification displayed the direction and intensity of peasants' social transitions. But it soon became clear that the complicated village structure was a result of two interacting processes. Along with the ongoing economic potential change of peasant households that led to a higher or lower status, households underwent »organic changes« (divisions, mergers, liquidations, etc.), caused by both demographic and social factors and resulting in transitions from one social stratum to another. And, finally, there were resettlements of peasants, also affecting social group quantities. Taken together, those processes produced a dynamic and internally contradictory picture of the rural social differentiation. That's why along with peasant household economic potential alterations, the dynamic censuses recorded a share of households, affected by »organic changes«, and their distribution by sown areas and working livestock capita.

Before, the revolution peasant households dynamic data were collected by individual enthusiasts of county council Statistics boards. Altogether, over a period of 1880-1900s the dynamic censuses were conducted in several districts of different areas. It turns out to be a very formidable challenge to arrange the data for comparative studies, to assess their reliability and representativeness. After the Revolution rural social transition studies became one of the principal tasks of State statistics bodies. For that purpose an agricultural dynamics department was set up within the framework of the Central Statistics Board. It was headed by A.Khryashcheva, a most vigorous advocate of dynamic censuses, who had been a county statistician in Tula province before the Revolution. She led the largest in the history of county statistics and, from the methodological point of view, most complete dynamic census of peasant households of Epiphan' district (6). Her set of techniques was employed without any alterations by the Central Statistics Board in 1920s. Dynamic censuses were carried out annually by one and the same nests (volost' or groups of villages) and covered over 600,000 households, which is the most extensive sample study of the precollectivization village. Over 9 years considerable data were gathered, making it possible to study various aspects of the NEP rural social processes. A substantial part of the materials was published (7).

The dynamic census data are used by historians to describe the productive forces and class structure of the village. Yet, the social transition data for the sake of which the censuses were conducted, have not taken full advantage of by historians.

## Simulative Model Structure

Thus, the rural social differentiation picture was created by two interacting processes. Firstly, the peasant households' economic potential was continuously changing, which resulted either in a higher social status or a lower one. Secondly, some households underwent »organic changes« (divisions, mergers, liquidations, etc.), brought about by both demographic and social factors, which also led to a transition from one stratum to another. And, finally, there were resettlements of peasants, affecting social group quantities as well (8).

As a whole the rural differentiation mechanism can be presented as a scheme (Fig.1), where T is the beginning of the period, for which transitions are recorded,  $T+1$  is the end of the period.

With the household group distribution data and the quantities of households that over a certain span of time shifted from one group into another as a result of a changed economic potential, any »organic change« or a resettlement, it is possible to produce a retroprognosis for the end of the time span with the help of a mathematical model. Proceeding from the assumption that the above mentioned processes were of invariable intensity and directions (a stationary model prerequisite), we can also obtain a retroprognosis for a more distant time.

Group-to-group transitions of peasant households, not affected by »organic changes«, are summarized in a table, which is called a transition matrix. It demonstrates in what direction and with what intensity the social processes went on in that category. To simulate group quantity dynamics we can make use of the apparatus of Markov chains. Markov models are the most simple of those taking into consideration group interrelations (9).

Social mobility simulation, based on the features of a Markov process with discrete time, is described by the original state of a system (i.e. original group quantities) and a matrix of group-to-group transition possibilities pending a »step«. Proceeding from the hypothesis that the transition structure is stable, Markov's model allows to get information on the following states of the system on the basis of original group quantities. That is how the retroprognosis of the social structure of peasants, not affected by »organic changes«, was made. Later on a share of households that underwent an »organic change« in each group is found out according to the source data. Liquidations and expulsions led to a deprivation of peasants' status. On the contrary, newly-settled or resettled peasants entered a social group, acquiring a certain status.

Divisions and mergers changed the total number of households, with newly-formed households moving into another group. Therefore, along with the share of divided and merged households, the quantity of new-

ly-formed households and their group distribution was taken into consideration. So, the corresponding percent ratios for every group of households, affected by an »organic change«, provided the necessary simulation parameters. Simultaneous calculations both for the households that remained stable over the period under consideration and for the households, affected by »organic changes«, could produce a retroprognosis of the total number of households and their quantities in every social group, which doesn't present a technical difficulty, but is associated with much of computer based calculations.

The above said simulation method has considerable limitations. For underlying it is the assumption that all the rural processes are of invariable intensity. That's why the results depend on the original data, the retroprognosis is being developed on. For example, if the data on household transitions from one group into another in a productive year, with an upward tendency as to the social status dominating over a downward one and the generally growing economic level, the prognosis will be made proceeding from these favourable conditions. In other words, the rural social structure could have been the same, as it has been predicted, only if all the years to follow had been productive and the economic situation hadn't undergone any substantial changes.

Calculations were done according to the above mentioned method for the data of each year from 1921 to 1928 to find out how much economic, natural and climatic factors affected the peasant social dynamics. Correspondingly, 8 models of the rural social structure dynamics were obtained.

Foretelling conclusions, we would like to note, that the retroprognoses proceeding from the economic conditions of various years provide a qualitatively homogeneous picture of the rural social processes development, however with quantitative differences. Furtheron the same method was applied to some regions of the country. It's essential that the rural social structure analysis was based on the household groupings by sown areas, as well as by productive and working livestock capita and the cost of means of production. That also produced qualitatively homogeneous results. So the proposed retroprognosis method allows to of disclosing indepth tendencies of the rural social structure development associated with the NEP petty commodity production.

## Statistical Data on Peasants' Social Dynamics in the Mid 20ies

Let's move on to the rural social processes, recorded by dynamic censuses of the mid 20ies. As an example we shall study household transitions of Russia's Productive Region in 1924-1925. That region, very important for food supplies of the country, comprised 32.5% out of 22.2 million peasant households (10).

The source data (Statisticheskij spravocnik SSSR. M., 1927, p. 66-69), describing the various components of the rural social dynamics, can be presented in three tables (Tables 1, 2, 3). The first thing to note is the extremely high mobility of the rural population. Over the year that incidentally was not marked by any natural or social disasters, 32% of the households changed their status. Second, strikingly large is the share of the moved and liquidated households in poorest groups and of the divided households in well-to-do groups (see Table 1). Divisions resulted in transitions of formerly rich households into a well-to-do group (see Table 2). The largest share of the »intact« households is in the group of households possessing from 4 to 10 dessiatines. Finally, it's evident, that transitions of households not affected by organic changes followed two directions. In poorest the groups an upward tendency towards a higher status dominated, while the status of well-to-do households tended to decline. In medium groups the proportions of households growing rich and poor were nearly equal. That's why the group of peasants with the sown area of 4-10 dessiatines turned out to be the most stable one (see Table 3).

These observations are important for the understanding of the essence of the NEP peasantry differentiation process. Although they can't be a reliable indication that there was no differentiation, as it is very difficult to find out a resultant of the opposite processes that took place in the village and contributed to the social strata quantity alteration.

## Simulation Results

What are the main results of the pre-collectivization peasantry social mobility simulation? Let's first consider the social dynamics retroprognosis of the rural population of Russia's Productive Region, made on the condition that the intensity and direction of processes stay at the same level, as it was in 1924-1925 (Table 4).

As the simulative model, the parameters of which were calculated according to the data of Tables 1-3, uncovers, the share of the poorest group with a sown area up to 2 dessiatines would considerably reduce over 15 years, while the share of households with a sown area of 2.1-4.0 dessiatines would remain almost unchanged. The proportion of peasants possessing from 4.1 to 10.0 dessiatines of sown area would increase significantly (almost by a third). Though the proportion of the well-to-do group with a sown area over 10.1 dessiatines would undergo the largest expansion (from 3.1% to 5.1%), its share in the peasant social structure was so unimportant, that the expansion would have a relatively weak effect on the depth of the rural social differentiation. Thus, if the NEP economic conditions had been sustained, the peasantry would not have splitted into opposed groups,



on the contrary, as the simulations results demonstrate, the position of medium strata would have grown stronger against the background of the overall economic growth. These tendencies are graphically depicted in the diagrams (see Fig.2 and 3).

To what extent do the obtained results reflect the specificity of the Productive Region? To answer this question, we turned to the data of dynamic censuses of the Consumptive Region, which embraced 24.8% of peasants household (11). On the whole the sown area index in that region was substantially lower than in the Productive Region (2.87 and 3.27 dessiatines per a household respectively). Due to that fact the similar social processes went on in the Consumptive Region as if on a lower level.

The retroprognosis results of the peasant social dynamics of the Productive and Consumptive Regions appeared to be analogous on the whole (Table 4; Fig.4 and 5). According to the model, in 15 years the proportion of poorest peasants with a sown area up to 2.0 dessiatines in the Consumptive Region would reduce from 60.4% to 38.7%. The share of households with a sown area of 2.1-4.0 dessiatines would increase from 31.2% to 37.4% while in the Productive Region the corresponding share would remain stable. As the retroprognosis shows, the number of households sowing from 4.1 to 10.0 dessiatines would grow by 3.6 times, their share jumping from 8.3% to 22.8%. The growth rate of households with a sown area over 10.1 dessiatines would be miraculous (12.3 times over 15 years). But in 1924 there were only 204 households of that kind out of 188914, covered by the dynamic census, therefore, however the explosive growth, the proportion of such households would amount to only 1% by the year 1940.

It should be noted that as the diagrams display, with the social development tendencies of the mid 20ies continued, the peasant social structure would undergo marked changes over the first 6-8 years and by the mid 30ies would become sufficiently stable.

## Conclusion

The analysis of the totality of the obtained retroprognoses discloses that over the 1920s there was not a single region in the country with intense rural differentiation and opposed groups formation. So even a relatively long existence of the NEP economic conditions (the prognosis was made up to the end of the 1930s, i.e. for 12-20 years) wouldn't cause more considerable differentiation.

The results of the pre-collectivization peasantry social dynamics analysis, based on data processing and mathematical simulation techniques, make us to challenge a theory that whenever and wherever there's market economy, differentiation and even polarization of petty commodity pro-

ducers is an inevitable consequence. The reality of life is extremely diverse and there is a variety of things, that are details, »particularities« from the point of view of the world historical development, and therefore are overlooked by the general theory, while a specific historical approach considers them decisive. The extent and pace of the petty commodity producers differentiation process is determined by overall economic, social and political conditions of the societal life. The New Economic Policy, a part of which was a freedom of exchange, inevitably led to a large household growth, but due to the low level of the productive forces development in agriculture, the small volume of surplus product, the total ruin of the country by two devastating wars that process was extremely slow.

As the simulative model shows, the NEP continuation would not have resulted in either explosive agricultural growth as some contend, or economic chaos and social catastrophes in the village, as others claim.

## Notes

1. Fitzpatrick S. Klassy i problemy klassovoj prinadlezhnosti v Sovetskoi Rossii 20-h godov// Voprosy istorii, 1990, N 8, s.25.
2. Koval'chenko I.D. Metody istoricheskogo issledovanija. M.JMauka, 1987.
3. Koval'chenko I.D. Ibid, s.407.
4. Borodkin L.I., Svishchev M.A. Sotsial'naja mobil'nost v period nepa: k voprosu o roste kapitalizma iz melkogo proizvodstva// Istoriya SSSR, 1990, N 5.
5. Voprosy istochnikovedenija dinamicheskikh perepisej 1920-h godov. In: Massovyie istochniki po sotsial'no-ekonomicheskoi istorii sovetskogo obshchestva. Moskva, 1979, S. 228-261.
6. Krestjanskoe khozjaistvo po perepisjam 1899-1911 gg. Epifanskij uezd, ch.1, 11. Tula, 1916.
7. See izdanie TsSU Dinamika krestjanskikh khozjaistv v 1920= 1925 gg. M.-L., 1931.
8. A sown area has usually been taken as a basis of the peasant household classification (see Table 1, representing a typical fragment of the source under consideration).
9. Bartholomew D.J. Stochastic Models for Social Processes. N.-Y., Toronto, 1982.
10. Saratov, Stalingrad, Tambov, Tbla, as well as Ural region, the Bashkir Autonomous Republic and the Autonomous Republic of Germans of Volga Region.
11. The Consumptive Region included the provinces of Arkhangelsk, Vladimir, Vologda, Ivanovo, Voznesensk, Kostroma, Leningrad, Moscow, Nizhny Novgorod, Novgorod, Pskov, Smolensk and Yaroslavl.

**Table 1.**  
**Peasants Households Dynamics. Productive Region Russia.**  
**Social-Organic Changes of The Household. 1924-1925.**

Sown area (dess.)	Total number of house- holds	Evicted (%)	Liqui- dated (%)	Divi- ded (%)	Joi- ned up (%)	Retur- ned (%)	Without organic changes (%)
<0,1	6324	6,2	10,8	0,4	1,9	11,1	80,5
0,1- 2,0	61386	2,6	2,0	1,0	1,3	2,7	92,9
2,1- 4,0	80855	1,2	1,0	2,0	0,6	2,2	95,0
4,1- 6,0	49914	0,8	0,8	3,6	0,4	1,1	94,3
6,1-10,0	29815	0,6	0,6	6,6	0,3	0,7	91,7
10,1-16,0	5996	0,5	0,4	10,8	0,5	1,1	87,4
16,1-25,0	1076	0,6	0,7	12,2	0,6	0,0	85,6
> 25	243	0,4	0,4	12,0	0,4	0,0	85,2
Total	235609	1,5	1,4	2,9	0,8	2,1	93,2

**Table 2.**  
**Peasants Households Dynamics. Productive Region of Russia.**  
**Distribution of Divided Households (%). 1924-1925.**

	Sown area (dess.)	Divided house- holds	Households groups (by sown area)							
			1	2	3	4	5	6	7	8
1	< 0,1	25	44,7	36,2	19,1	0,0	0,0	0,0	0,0	0,0
2	0,1-2,0	600	8,5	75,8	14,1	1,4	0,3	0,0	0,0	0,0
3	2,1-4,0	1602	3,0	55,7	35,5	4,7	1,0	0,1	0,0	0,0
4	4,1-6,0	1790	1,9	33,3	44,0	17,6	3,3	0,2	0,1	0,0
5	6,1-10,0	1968	1,4	18,3	37,3	26,3	15,5	1,1	0,0	0,0
6	10,1-16,0	644	1,4	9,2	25,9	23,5	28,6	10,1	1,1	0,0
7	16,1-25,0	132	4,1	6,1	17,3	19,4	25,5	21,1	6,1	0,0
8	> 25,0	29	1,5	3,0	6,1	10,6	24,3	24,3	15,2	15,0

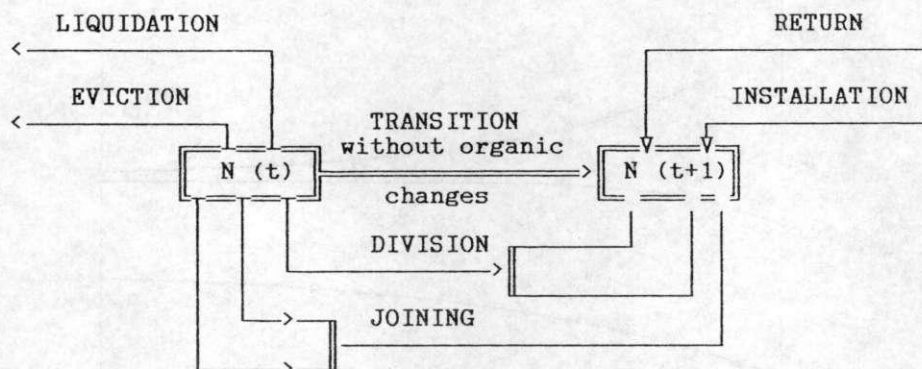
**Table 3.**  
**Peasants Households Dynamics. Productive Region of Russia.**  
**Households Without Social-Organic Changes. 1924-1925.**

	Sown area (dess.)	Number house- holds	Intergroup's transitions, (%)								
			1	2	3	4	5	6	7	8	
1	< 0,1	5091	57,6	32,0	7,0	2,2	0,9	0,2	0,0	0,0	
2	0,1-2,0	52027	2,2	71,9	23,7	1,9	0,3	0,0	0,0	0,0	
3	2,1-4,0	76812	0,2	9,8	68,1	19,2	2,4	0,2	0,1	0,0	
4	4,1-6,0	47069	0,1	1,0	18,0	60,6	19,7	0,6	0,0	0,0	
5	6,1-10,0	27340	0,0	0,3	3,3	19,3	67,3	9,5	0,3	0,0	
6	10,1-16,0	5241	0,0	0,2	1,1	4,9	30,1	54,7	8,7	0,2	
7	16,1-25,0	921	0,0	0,2	0,5	1,1	6,7	32,6	50,7	8,3	
8	> 25	207	0,0	0,0	0,5	0,5	1,4	9,2	27,1	61,4	
Total			219708	2,0	23,1	34,3	22,7	14,3	2,8	0,5	0,1

**Table 4.**  
**The Results of Simulation of Peasants Household Dynamics.**  
**1924-1940.**

Sown area (dess.)	Number of Households				Ratio 1940/1924 (%)	
	1924		1940			
	(real data)	(retroprognosis)				
	Number	%	Number	(%)		
Productive Region of Russia						
	< 0,1	6324	2,7	4317	1,3	68,3
	0,1- 2,0	61386	26,0	56653	17,5	92,3
Total	0,0- 2,0	67710	28,7	60970	18,8	90,0
	2,1- 4,0	80855	34,3	104336	32,3	129,0
	4,1- 6,0	49914	21,2	81267	25,2	162,8
	6,1-10,0	29815	12,7	60494	18,6	202,9
Total	4,1-10,0	79729	33,9	141761	43,8	177,8
	10,1-16,0	5996	2,5	13381	4,1	223,2
	16,1-25,0	1076	0,5	2701	0,8	251,0
	> 25,0	243	0,1	512	0,2	210,7
Total	> 10,0	7315	3,1	16594	5,1	226,8
	Total	235609	100,0	323661	100,0	137,4
Consumptive Region of Russia						
	< 0,1	7147	3,8	6740	2,7	94,3
	0,1- 2,0	106897	56,3	88570	36,0	82,9
Total	0,0- 2,0	114044	60,4	95310	38,7	83,5
	2,1- 4,0	58951	31,2	92070	37,4	156,2
	4,1- 6,0	12625	6,7	37709	19,9	298,7
	6,1-10,0	3090	1,6	18315	7,5	592,7
Total	4,1-10,0	15715	8,3	56024	22,8	356,5
	10,1-16,0	194	0,1	2296	0,9	1.183,5
	16,1-25,0	8	0,0	264	0,1	3.300,0
	> 25,0	2	0,0	0	0,0	0,0
Total	> 10,0	204	0,1	2560	1,0	1.225,5
	Total	189914	100,0	245964	100,0	129,5

**Figure 1.** The Structure of Peasant Households Dynamic Model



**Figure 2.**

# GROUPS DYNAMICS RETROPROGNOSIS:

PEASANT HOUSEHOLDS OF PRODUCTIVE REGION

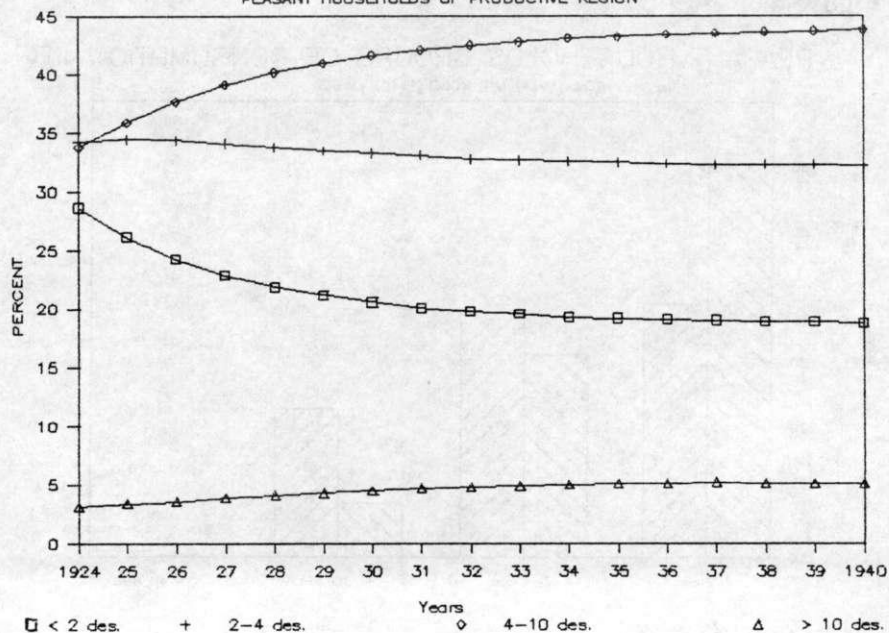


Figure 3.

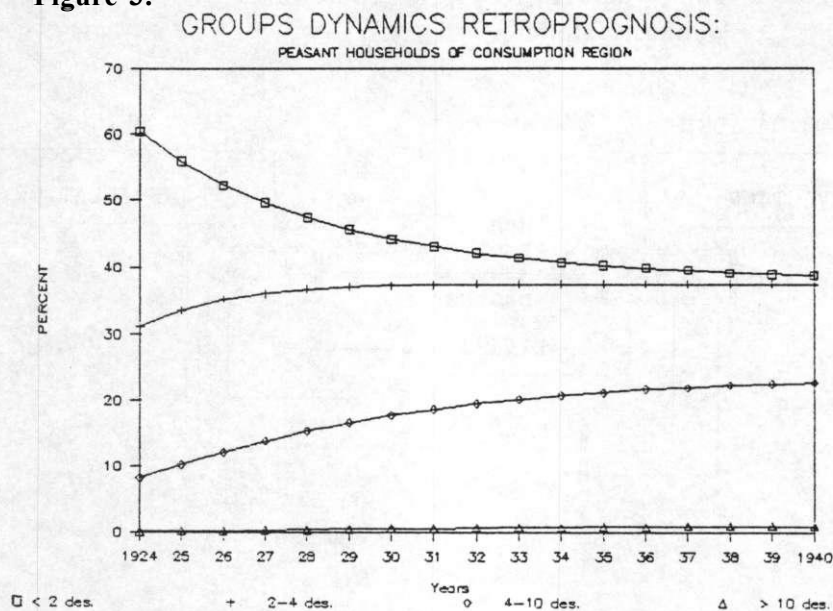


Figure 4.

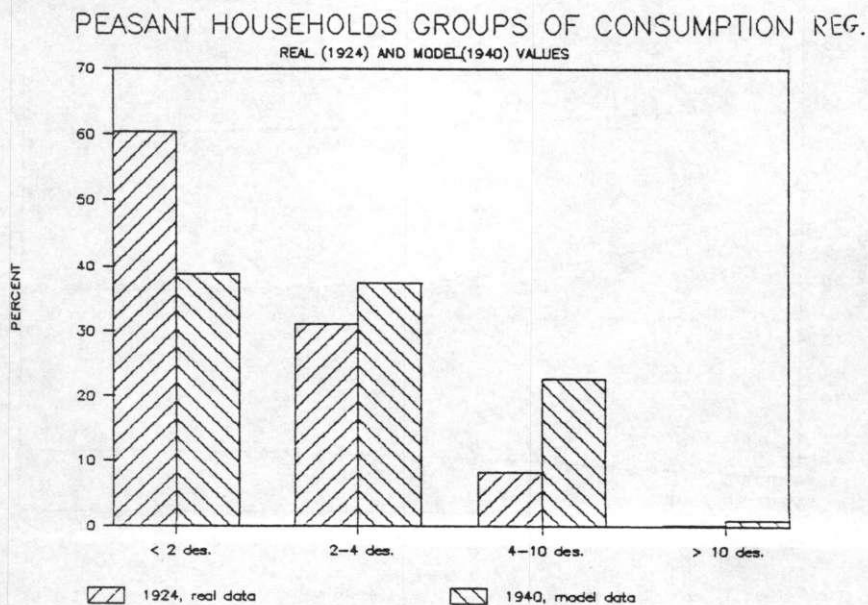




Figure 5.

# PEASANT HOUSEHOLDS GROUPS OF PRODUCTIVE REG.

REAL (1924) AND MODEL(1940) VALUES

